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**FACSIMILE COVER SHEET**

DATE: January 9, 2006

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TO: Office of Petitions

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COMPANY OR FIRM: PTO

FACSIMILE NO.: (571) 273-0025

FROM: Beth Pearson-Naul for Paul S. Madan

RE: Serial No.: 09/936,624

Docket No.: IO-1013US

Title: "Integrated Multi-Axis Assembly and Packaging"

NUMBER OF PAGES INCLUDING THIS COVER SHEET: 13

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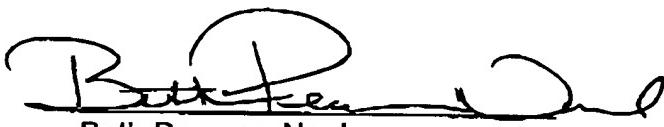
DATE: January 9, 2006 **FAX RECEIVED**  
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COMPANY OR FIRM: PTO **OFFICE OF PETITIONS**  
FACSIMILE NO.: (571) 273-0025  
FROM: Beth Pearson-Naul for Paul S. Madan  
RE: Serial No.: 09/936,623 <sup>4</sup>  
Docket No.: IO-1013US  
Title: "Integrated Multi-Axis Assembly and Packaging"

NUMBER OF PAGES INCLUDING THIS COVER SHEET: 13

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## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Larry Rushefsky et al.

S

Group Art Unit: 2856

SERIAL NO.: 09/936,634

S

Examiner: Tamiko D. Bellamy

FILED: June 4, 2002

S

Atty. Docket: IO-1013US

TITLE: Integrated Multi-Axis Assembly  
and Packaging

S

Confirmation No. 8725

FAX RECEIVED

JAN 09 2006

PETITION TO WITHDRAW HOLDING OF ABANDONMENT  
UNDER 37 CFR 1.181(a)

## OFFICE OF PETITIONS

Commissioner of Patents  
P.O. Box 1450  
Alexandria, Virginia 22313-1450

Dear Sirs:

Applicants received a Notice of Abandonment mailed December 22, 2005 stating abandonment of the captioned application in view of Applicant's failure to timely file a proper reply to the Office letter mailed on June 14, 2005. Applicants respectfully submit that the Notice of Abandonment is inappropriate as a response to the June 14, 2005 Office letter was timely filed.

Attached is a copy of the Response to Office Action Dated June 14, 2005 and Request for Extension of Time, both of which were filed on December 14, 2005 via first class mail, and posted on PAIR December 20, 2005. Also attached is a copy of Applicants' return postcard showing a date stamp by the USPTO (OIPC) as December 20, 2005.

Applicants believe that no fees are due with this Petition but should the Office deem otherwise, the Commissioner is authorized to charge any fees or credit any overpayment to Deposit Account No. 13-0010 (IO-1013US).

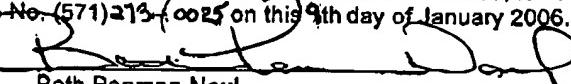
Respectfully submitted,

Date: January 6, 2006

  
Paul S. Madan, Registration No. 33,011  
Madan, Mossman & Sriram, P.C.  
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Beth Pearson-Naul

2856 TFW



## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: Larry Rushefsky et al.

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Group Art Unit: 2856 FAX RECEIVED

SERIAL NO.: 09/936,634

Examiner: Tamiko D. Bellamy JAN 09 2006

FILED: June 4, 2002

Atty. Docket: IO-1013US OFFICE OF PETITIONS

TITLE: "Integrated Multi-Axis  
Assembly and Packaging"

Confirmation No.: 8725

MS: Amendment  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

## RESPONSE TO OFFICE ACTION DATED JUNE 14, 2005

This is in response to the Office Action, dated June 14, 2005 for the above-identified patent application.

Amendments to the application begin at page 2.

Amendments to the Claims begin at page 2.

Remarks begin at page 9.

**AMENDMENTS TO THE CLAIMS**

Claims 1-8 (cancelled)

9. (currently amended) An integrated sensor apparatus comprising:  
a housing including a cavity for receiving a sensor, one or more parallel planar surfaces, a bottom surface of the cavity, a bottom exterior surface, a top exterior surface, one or more side surfaces, one or more bond pads on one or more of the parallel planar surfaces, one or more bond pads on the bottom exterior surface, one or more bond pads on the top exterior surface, and one or more bond pads on one or more of the side surfaces;

a sensor module within the housing, the sensor module including a plurality of sensor packages coupled to a substrate having slots for receiving the sensor packages, each sensor package having an axis of sensitivity positioned in a different spatial direction; and

a control circuit coupled to the housing for controlling the sensor module.

10. (previously presented) The apparatus of claim 9, wherein the sensor module comprises at least one micro-machined accelerometer.

11. (previously presented) The apparatus of claim 9, wherein the sensor module comprises three micro-machined accelerometers positioned such that the axes of sensitivity are substantially orthogonal to each other.

12. (previously presented) The apparatus of claim 9, wherein the control circuit is an application specific integrated circuit.

13. (previously presented) The apparatus of claim 9, wherein the sensor module is a monolithic package selected from a group consisting of i) a hollow frame; ii) a box; iii) a three-dimensional circuit board; iv) a cylinder; and v) a cube.
14. (previously presented) The apparatus of claim 9 wherein the sensor packages include a sensor coupled to the sensor package.
15. (cancelled).
16. (cancelled)
17. (currently amended) The sensor module of claim 15 9, wherein the housing cavity further includes one or more resilient couplings for resiliently coupling the sensor to the package, and wherein the cross sectional shape of the resilient couplings is selected from a group consisting of i) approximately rectangular, and ii) approximately circular.
18. (previously presented) The sensor module of claim 17, wherein the resilient couplings further include one or more bumpers for slidingly supporting the sensor.
19. (previously presented) The sensor module of claim 17, wherein the housing cavity includes a bottom surface, and wherein the resilient couplings are coupled to the bottom surface of the cavity.
20. (previously presented) The sensor module of claim 19 wherein the resilient couplings are approximately positioned at one or more ends of the bottom surface of the cavity of the housing.
21. (previously presented) The sensor module of claim 19, wherein the resilient couplings are approximately positioned at the approximate center of the bottom surface of the cavity of the housing.
22. (previously presented) The sensor module of claim 17, wherein the housing cavity

includes a bottom surface, and wherein the bottom surface of the cavity further includes a recess in the bottom surface of the cavity for receiving the resilient couplings.

23. (previously presented) The sensor module of claim 22, wherein the resilient couplings are approximately positioned at the approximate center of the recess of the bottom surface of the cavity.

24. (currently amended) The sensor module of claim 15-9, wherein the cavity of the housing further includes a bottom surface, wherein one or more bumpers are coupled to the bottom surface of the cavity for slidlingly supporting the sensor in the housing.

25. (previously presented) The sensor module of claim 24, wherein the bumpers include a cross-sectional shape selected from a group consisting of i) approximately square, approximately rectangular, ii) approximately circular, and iii) approximately triangular.

26. (currently amended) The sensor module of claim 15-9 wherein the sensor includes one or more bond pads for coupling the sensor to the housing.

27. (previously presented) The sensor module of claim 26, wherein the bond pads cross sectional shape is selected from a group consisting of i) approximately rectangular, ii) approximately circular, iii) approximately oval, iv) approximately tri-oval, v) approximately oct-oval, vi) approximately wavy sided rectangular, vii) approximately oct-pie-wedge, viii) approximately hollow oct-pie-wedge, ix) approximately nine circular, x) approximately starburst, and xi) approximately sunburst.

28. (currently amended) The sensor module of claim 15-9, wherein the sensor further includes one or more passive regions at one or more ends of the sensor, wherein the sensor further includes one or more bond pads, and wherein the bond pads may be located at one or more ends in the passive regions.

29. (currently amended) The sensor module of claim 15-9, wherein the sensor further includes one or more active regions, wherein the sensor further includes one or more bond pads, and wherein the bond pads may be located in the approximate center of the active regions.

30. (currently amended) The sensor module of claim 15-9, wherein the housing further includes one or more wire bonds;

wherein the sensor further includes one or more parallel planar surfaces;

wherein the housing further includes one or more parallel planar surfaces; and

wherein the wire bonds electrically couple the parallel planar surfaces of the sensor to the parallel planar surfaces of the housing.

31. (previously presented) The sensor module of claim 12, wherein the sensor further includes a mounting member for removably coupling the sensor to the housing.

32. (previously presented) The sensor module of claim 31, wherein the mounting member is a shorting clip.

33. (previously presented) The sensor module of claim 31, further including a spring assembly for removably coupling the mounting member to the housing.

34. (previously presented) The sensor module of claim 9, wherein the control circuit comprises:

a controller;

an adhesive for coupling the controller to the housing;

one or more wire bonds for coupling the controller to the housing; and

an encapsulant for encapsulating the controller and wire bonds.

35. (previously presented) The sensor module of claim 34, wherein the controller is

placed on one of i) the top exterior surface of the housing, and ii) a bottom exterior surface of the housing.

36. (currently amended) A method of packaging a sensor assembly comprising:  
providing a housing;  
disposing a sensor module within the housing wherein the sensor module includes a plurality of sensor packages coupled to a substrate having slots for receiving the sensor packages, each sensor package having an axis of sensitivity in a different special direction;  
disposing a controller on the housing; and  
coupling the controller to the sensor module with an electrical coupling, wherein the controller is subsequently used to control the sensor module, wherein disposing the controller further comprises:

dispensing an adhesive on the housing;  
placing the controller onto the adhesive;  
curing the adhesive;  
wire-bonding the controller to the housing;  
encapsulating the controller and the wire bonds with an encapsulant; and  
curing the encapsulant.

37. (cancelled)

38. (previously presented) The method of claim 36, wherein the sensor module includes a micro-machined accelerometer.

39. (previously presented) The method of claim 36, wherein the controller includes a plurality of controller bond pads and the housing includes a plurality of bond pads;  
wherein wire-bonding the controller to the housing comprises;

soldering a plurality of wires to corresponding controller bond pads; and  
soldering a corresponding end of the wires to corresponding housing bond pads.

40. (previously presented) The method of claim 36, wherein the housing includes:  
a cavity;  
one or more planar surfaces; a top surface;  
a bottom surface; and  
one or more housing bond pads on the planar surfaces;  
wherein the cavity is for receiving the sensor module;  
wherein the planar surfaces are for coupling the sensor module, and the controller to  
the housing; and  
wherein the housing bond pads are for coupling the planar surfaces to the controller.
41. (previously presented) The method of claim 40, wherein the housing cavity further  
includes  
one or more resilient couplings for resiliently coupling the sensor to the cavity.
42. (previously presented) The method of claim 41, wherein coupling the sensor module  
to the housing comprises;  
placing a spring assembly in the housing cavity;  
coupling a mounting member to the sensor module;  
placing the sensor module within the housing cavity; and  
coupling the mounting member to the spring assembly.
43. (previously presented) The method of claim 42, wherein the mounting member is a  
shorting clip.

44. (previously presented) The method of claim 36, wherein the different spatial directions are orthogonal to each other.

45. (previously presented) The method of claim 36, wherein the sensor packages are coupled to each other.

**REMARKS**

Claims 9-45 are pending in the application. The Examiner objects to claims 16, 24, 25, 31,-34, 37, 42 and 43. Claims 9-15, 17-23, 26-30, 35, 36, 44 and 45, stand rejected, and claim 16, 24, 25, 31-34, 37, 42 and 43 stands allowable if rewritten to overcome the Examiner's rejection.

**ALLOWABLE SUBJECT MATTER**

The Examiner concludes that claims 16, 24, 25, 31-34, 37, 42, and 43 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

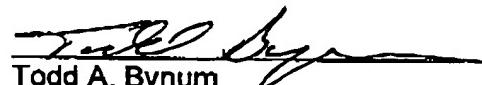
Applicant has amended claim 9 to incorporate the elements of cancelled claims 15 and claim 16, which arrangement has is considered allowable. Applicant has amended claim 36 to include the elements of cancelled claim 37, which arrangement is considered allowable.

**CONCLUSION**

For all the foregoing reasons, Applicant submits that the application is in a condition for allowance. Applicant files herewith a request for extension of time and the associated fee for filing this paper. The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to Deposit Account No. 13-0010 (IO-1013US).

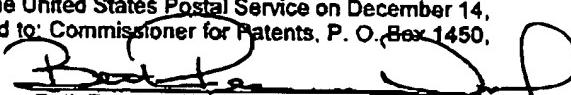
Respectfully submitted,

Dated: December 14, 2005

  
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**CERTIFICATE OF MAILING**

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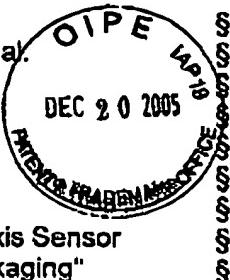
  
Beth Pearson-Naul

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE FAX RECEIVED**

In Re Application of:  
Larry Rushefsky et al.

Serial No.: 09/936,634

Filed: June 4, 2002

Title: "Integrated Multi-Axis Sensor  
Assembly and Packaging"

JAN 09 2006

Art Unit: 2856

**OFFICE OF PETITIONS**

Examiner: Richard Alan Moller

Docket No.: IO-1013US

Confirmation No.: 8725

Commissioner for Patents  
P. O. Box 1450  
Alexandria, Virginia 22313-1450

**REQUEST FOR EXTENSION OF TIME**

Applicant hereby requests a three month extension of time until December 14, 2005 to file a response to the Office Action dated June 14, 2005.

The required fee of \$1,020.00 is enclosed herewith by check. The Commissioner is hereby authorized to charge any additional fees or credit overpayment to Deposit Account No. 13-0010 (IO-1013US).

Respectfully submitted,

Date: December 14, 2005

  
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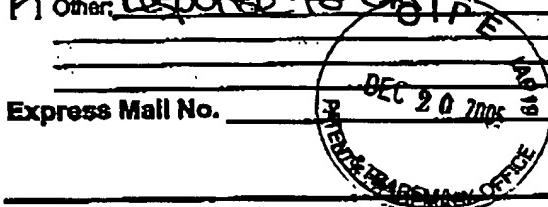
  
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DOCKET NO.: 10-10345  
SERIAL NO./PAT NO.: 09/936,634  
DATE MAILED: 12-14-05  
DATE DUE: 9-14-05  
APPLICANT: Rushefsky et al.  
TITLE: Integrated Multifunctional Sensor Assembly and Packaging

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